

## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>7</sup> :

H01J 35/14, 35/30

A1

(11) International Publication Number:

WO 00/58991

(43) International Publication Date:

5 October 2000 (05.10.00)

(21) International Application Number: PCT/GB00/01164

(22) International Filing Date: 27 March 2000 (27.03.00)

(30) Priority Data:

9906886.8

26 March 1999 (26.03.99)

GB

(71) Applicant (for all designated States except US): BEDE SCIENTIFIC INSTRUMENTS LIMITED [GB/GB]; Bowburn South Industrial Estate, Bowburn, Durham DH6 5AD (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): LOXLEY, Neil [GB/GB];

9 Whitesmocks Avenue, Durham DH1 4HP (GB). TAYLOR, Mark [GB/GB]; 71 Salutation Road, Darlington DL3 8JW (GB). WALL, John, Leonard [GB/GB]; 34 Cheltenham Way, Newton Aycliffe DL5 4YD (GB). FRASER, Graham, Vincent [GB/GB]; Whitehouse Farm Cottage, Heighington, Darlington DL2 2XQ (GB).

(74) Agent: MURGITROYD &amp; COMPANY; 373 Scotland Street, Glasgow G5 8QA (GB).

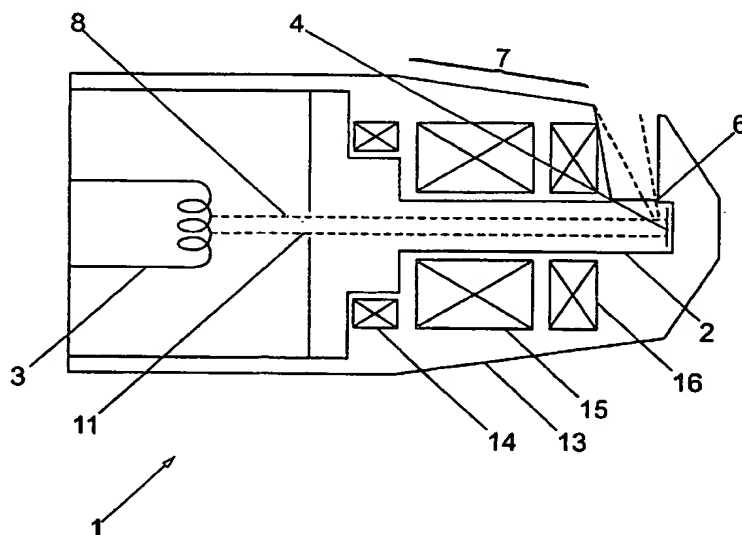
(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

## Published

With international search report.

Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: METHOD AND APPARATUS FOR PROLONGING THE LIFE OF AN X-RAY TARGET



## (57) Abstract

An X-ray generator (1) comprises an evacuated and sealed X-ray tube (2), containing an electron gun (3) and an X-ray target (4). An electron beam is produced by the electron gun (3) in which the cathode is at negative high voltage, the electron gun (3) consisting of a filament just inside the aperture (11) of a Wehnelt grid which is biased negatively with respect to the filament. Two sets of beam deflection coils (14), are employed in two planes, mounted between the anode of the electron gun (3) and the focussing lens (15) to centre the beam. Between the focussing lens (15) and the target (4) is an air-cored quadrupole magnet which acts as a stigmator (16) in that it turns the circular cross-section of the beam into an elongated one. This quadrupole (16) can be rotated about the tube axis so as to adjust the orientation of the line focus. The beam can be moved about on the target surface (4) by controlling the currents in the four coils of the quadrupole (16).